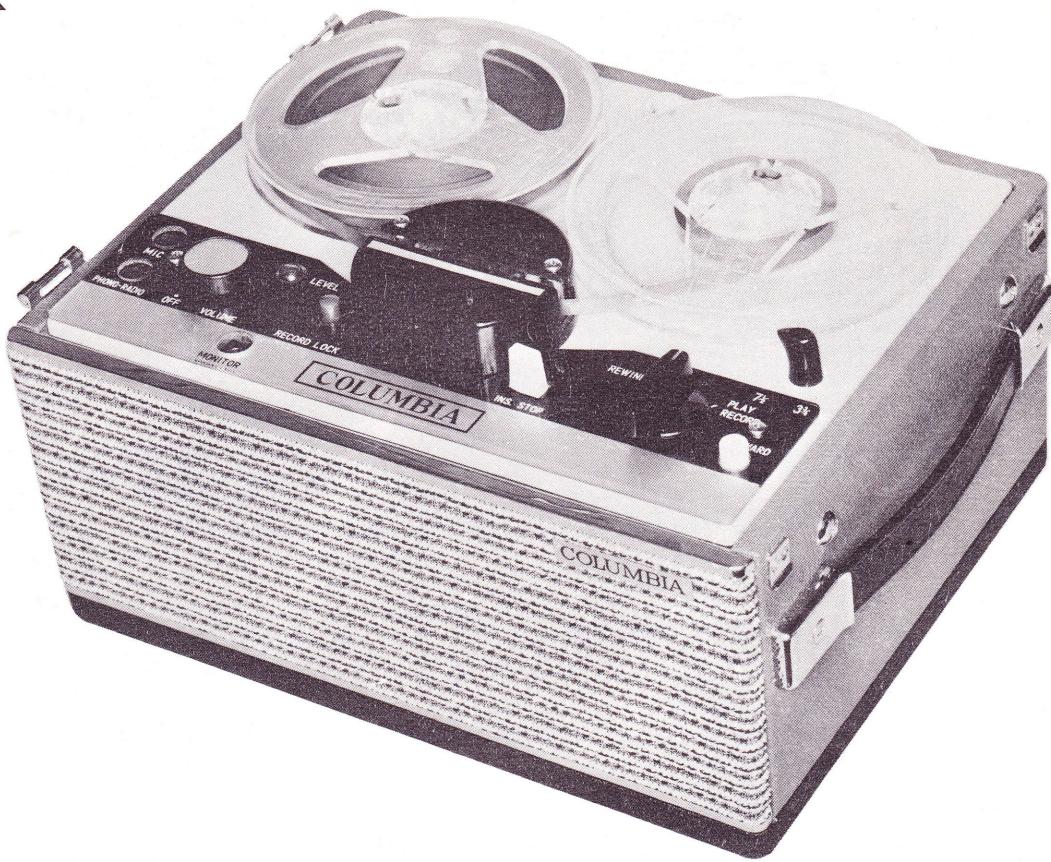


PHOTOFAC[®] FolderCOLUMBIA
MODEL C690-TRCOLUMBIA
MODEL C690-TRCOLUMBIA
MODEL C690-TR

GENERAL INFORMATION

The Columbia Model C690-TR tape recorder is a two-speed tape recorder designed to play and record monaurally, two tracks on standard width recording tape.

Recordings may be made from a phonograph, radio, or television receiver as well as those made directly from the microphone.

The two tape speeds are 7 1/2 and 3 3/4 ips. Using both tracks, the recording and playing times are as follows:

Reel Size 5" (600 ft.)	3 3/4" Speed 1 hour	7 1/2" Speed 1/2 hour
---------------------------	------------------------	--------------------------

This unit is designed to operate on 60 cycles, 110-120 volts, AC supply only.

Supplied By:

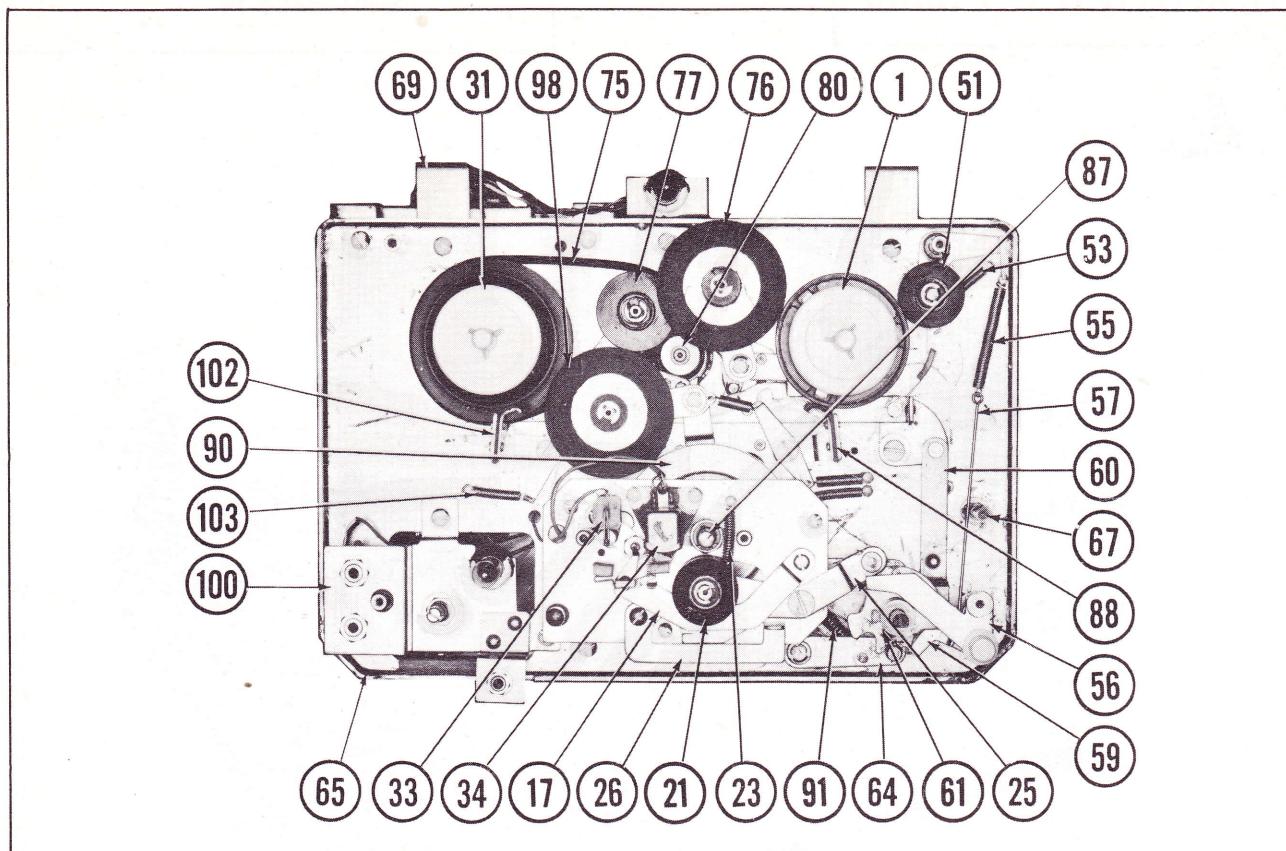
Columbia Phonographs
Dept. of CBS Electronics
405 Park Avenue
New York 22, N. Y.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guarantee by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of CQ451

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TOP VIEW OF MECHANISM WITH DRESS PLATE REMOVED

FUNCTION OF CONTROLS

On-Off Volume

The On-Off-Volume control energizes the motor and amplifier circuits. The volume controls the recording level when the unit is in the Record mode.

Function Selector

This control selects the different modes of operation. Turning this control counterclockwise from the Stop position, places the unit in the Rewind mode. Turning this control clockwise, places the unit in the Play Record mode.

Record Lock

Depress the Record Lock button to place the unit in the Record mode when the Function Selector is moved to the Play/ Record position.

Forward Knob

The Forward knob winds the tape onto the takeup (right) reel. This is done by depressing the knob and moving the Function Selector to the Play Record position.

Instant Stop Key

The Instant Stop key allows the operator to stop the tape temporarily so as not to record unwanted portions such as commercials, etc.

Speed Change

Moving the speed change knob to the extreme counterclockwise position sets the motor speed for recording at 7 1/2 ips. When the knob is moved to the extreme clockwise position the motor speed is set for recording at 3 3/4 ips.

OPERATING INSTRUCTIONS

Threading The Tape

1. Place a reel of tape on supply (left) reel stand (31).
2. Place an empty reel on takeup (right) reel stand (1).

3. Unwind about 12" of tape from supply reel. Hold a section of tape taut and insert it in the tape slot. Make sure the dull coated side of tape faces the recording head.

4. Insert the free end of the tape into one of the

radial slots in the hub of the takeup reel. Turn the reel several turns counterclockwise to fasten the tape to the reel and to take up all slack between reels.

To Record From Microphone

1. Thread tape as described under "Threading the Tape".
2. Rotate the On-Off-Volume control clockwise to turn recorder on. Allow a sufficient time for tubes to warm up.
3. Insert the microphone plug into the "MIC" jack.
4. Set the speed change control for the desired recording speed.
5. Hold Record Lock knob down and move Function Selector to Play/ Record position.
6. Hold the microphone about 8 to 12 inches from your mouth and speak in a normal voice.
7. Adjust the volume control until the record level indicator flashes on the loudest sounds.

NOTE: Recordings may be monitored by placing a crystal earphone in the Monitor jack.

IMPORTANT: Correct volume level on recording is very important. Too weak of a signal will result in weak playback and high background noise. Too strong of a signal will result in overloading and distortion during playback.

Recording Radio Programs

Radio programs may be recorded by one of the following methods:

1. Microphone Pickup from Speaker of Radio — Place the microphone about 8 to 12 inches in front of the radio speaker. Turn the radio volume control to a normal level. Turn the radio tone control to treble or high. Set the recording level and record as under "To Record From Microphone".
2. Direct Connection to Radio Speaker — Using the accessory cable, connect the alligator clips across the voice coil terminals of the radio speaker. Insert the cable plug into the "Radio-speaker" jack. Insert the cable plug into the "Radio-Phono" jack. Set the radio volume and tone controls as described in Step 1. Set the recording level and proceed as described under "To Record From Microphone".
3. Direct Connection to Volume Control of Radio — Using the accessory cable, connect the alligator clips across the radio volume control. Insert the cable plug into the "Radio-Phono" jack. Set the recording level and proceed as described under "To Record From Microphone". The setting of the radio volume and tone controls will have no effect on this setup.

To Record From Phonograph

A phone type plug is required on the phonograph pickup leads. Insert this plug into the "Radio-Phono" jack and proceed as described under "To Record From Microphone".

To Record From a Television Receiver

Use one of the methods described under "Recording Radio Programs".

Dual Track Recording

These recorders are designed to record and play back on one-half the width of the tape at a time, thereby, resulting in two track recording. After the recording is completed, and all tape is wound on the takeup (right) reel, remove reels from recorder. Turn the reels over and place full reel on left spindle. Properly thread tape and proceed with recording. After the second track has been recorded, the first track can be played back in the same manner.

Rewind

To rewind the tape, turn the Function Selector knob to the Rewind position.

To Play a Recording

1. Thread the tape as described under "Threading the Tape".
2. Turn Function Selector knob to the Play position.
3. Adjust the volume control to the desired listening level.

To Erase a Recording

Any recording on the tape is automatically erased before a new one is put on the tape when the unit is in the Record position. To erase a recording without putting anything on tape, follow normal recording procedure but leave microphone disconnected and volume control at a minimum.

To Edit And Splice Tape

NOTE: It is impossible to edit and splice one track without affecting the other. Recordings to be edited should be limited to one track recordings only.

Tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements can be inserted between selections, etc. Unused tape can be spliced for reuse.

For best results, cut tape at a slight diagonal, butt ends together and fasten on glossy side with splicing tape. Trim off any excess width.

DISASSEMBLY

To Remove Recorder From Case

1. Remove case cover.
2. Remove screws (2 each) from each side and rear of case.
3. Lift recorder up and away from case far enough so the speaker leads can be disconnected.
4. Lift entire unit from case.
5. Reverse above procedure to reassemble.

To Remove Amplifier From Tape Transport

1. Remove the hex nut from the On-Off-Volume controls and remove the control.
2. Remove the hex nuts from the Microphone,

Radio-Phono, and Monitor jacks. Remove the jacks.

3. Remove the record level and ready lights from their mountings.
4. Disconnect the motor leads from the power transformer.
5. Disconnect the Record Playback and erase head wires.
6. Remove the three screws holding the tape transport to the amplifier chassis brackets.
7. Remove the tape transport from the amplifier chassis.
8. To reassemble, reverse above procedure.

CLEANING

Pressure roller (21), capstan shaft (87), tape guides (44), erase head (33), and play-record head (34) may accumulate tape oxide coating, worn off the tape as it passes these parts. This accumulation will cause poor performance and should be removed with a soft lint-free cloth dipped in alcohol.

LUBRICATION

Under normal operation, the mechanism should be lubricated once every three months. All bearing surfaces should be lubricated with a good grade of oil. Lubricate the cams and levers with a non-hardening grease. Make sure no oil or grease gets on the rubber surfaces of the drive wheels.

HEAD ADJUSTMENT

The Play-Record head (34) and the erase head (33) are aligned at the factory. The heads should not need adjustment unless they are replaced.

Play-Record Head

The top edge of the Play-Record head (34) must be set evenly with top edge of tape. Thread tape on recorder and adjust head by moving spring loaded screws (36) up or down to correct position. After ad-

justing head height, adjust rear screws (36) so that head is perpendicular to tape.

Erase Head

The erase head (33) should be adjusted so that the pole piece covers the top half of the tape. The face of the erase head should be as nearly perpendicular to tape as possible by visual alignment.

TROUBLE CHART

Symptom	Cause	Remedy
No record or playback.	<ol style="list-style-type: none">1. Defective motor (74).2. Defective idler wheel (98).3. Defective drive idler wheel (76).4. Broken spring (35).5. Defective Play-Record head (34).6. Broken pressure roller spring (23).	<ol style="list-style-type: none">1. Replace motor (74).2. Replace idler wheel (98).3. Replace drive idler wheel (76).4. Replace spring (35).5. Replace Play-Record head (34).6. Replace pressure roller spring (23).
No Rewind.	<ol style="list-style-type: none">1. Drive belt (75) broken.	<ol style="list-style-type: none">1. Replace drive belt (75).

TROUBLE CHART (CON'T.)

Symptom	Cause	Remedy
	2. Defective motor service pulley (80).	2. Replace motor service pulley (80).
No Erase.	1. Defective Erase head (33).	1. Replace Erase head (33).
Reel stands binding.	1. Broken brake spring (53) or (103).	1. Replace brake spring (53) or (103).
No Takeup.	1. Broken spring (92).	1. Replace spring (92).

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	690-1	Takeup Reel Stand	54	690-54	Bushing
2	690-2	Set Screw	55	690-55	Spring
3	690-3	Screw	56	690-56	Lock Bracket
4	690-4	Head Cover	57	690-57	Rod
5	690-5	Set Screw	58	690-58	Spring
6	690-6	Set Screw	59	690-59	Tension Bracket
7	690-7	Speed Change Knob	60	690-60	Slide Bracket
8	690-8	Function Control Knob	61	690-61	Function Cam
9	690-9	Screw	62	690-62	Spring
10	690-10	Instant Stop Tab	63	690-63	Record Control Bracket
11	690-11	Escutcheon	64	690-64	Function Cam Lever
12	690-12	Screw	65	690-65	Base Plate
13	690-13	Dress Plate	66	690-66	Pin
14	690-14	Forward Knob	67	690-67	Speed Change Shaft
15	690-15	Spring Plate	68	690-68	Speed Change Lever
16	690-16	Screw	69	690-69	Case Mounting Bracket
17	690-17	Tape Pad Bracket	70	690-70	Motor Board Mount Sleeve
18	690-18	"C" Washer	71	690-71	Grommet
19	690-19	Fibre Washer	72	690-72	Motor Board
20	690-20	Felt Washer	73	690-73	Motor Mount Sleeve
21	690-21	Pressure Roller	74	690-74	Motor
22	690-22	Washer	75	690-75	Drive Belt
23	690-23	Pressure Roller Spring	76	690-76	Drive Idler Wheel
24	690-24	Screw	77	690-77	Drive Pulley
25	690-25	Pressure Roller Bracket	78	690-78	Rewind Actuating Lever
26	690-26	Instant Stop Bracket	79	690-79	Drive Idler Wheel Bracket
27	690-27	Screw	80	690-80	Motor Service Pulley
28	690-28	Plate	81	690-81	Idler Wheel Bracket
29	690-29	Hex Nut	82	690-82	Drive Lever
30	690-30	Bushing	83	690-83	Spring
31	690-31	Supply Reel Stand	84	690-84	Spring
32	690-32	Volume Control Knob	85	690-85	Bracket
33	690-33	Erase Head	86	690-86	Idler Tension Bracket
34	690-34	Play-Record Head	87	690-87	Capstan Shaft
35	690-35	Spring	88	690-88	Right Brake Shoe Bracket
36	690-36	Head Adjustment Screw	89	690-89	Spring
37	690-37	Head Mounting Plate	90	690-90	Flywheel
38	690-38	Screw	91	690-91	Spring
39	690-39	Spring	92	690-92	Spring
40	690-40	Hex Nut	93	690-93	Spring
41	690-41	Erase Head Bracket	94	690-94	Speed Change Tension Spring
42	690-42	Screw	95	690-95	Spring Cap
43	690-43	Hex Nut	96	690-96	Bolt
44	690-44	Tape Guide	97	690-97	Supply Spindle Pulley Assembly
45	690-45	"C" Washer	98	690-98	Idler Wheel
46	690-46	Fibre Washer	99	690-99	Hex Nut
47	690-47	Upper Clutch	100	690-100	Mounting Plate
48	690-48	Felt Washer	101	690-101	Main Control Lever
49	690-49	Felt Washer	102	690-102	Left Brake Shoe Bracket
50	690-50	Lower Clutch	103	690-103	Spring
51	690-51	Tension Roller	104	690-104	Record Knob
52	690-52	Tension Roller Lever	105	690-105	Record Cam
53	690-53	Spring	106	690-106	Cam Stop

COLUMBIA
MODEL C690-TR

FOLDER 8

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES

GENERAL ELECTRIC		RAYTHEON		SYLVANIA	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	Preamplifier	12AX7	V2	AF Amp. -Output-Bias Osc.	12BH7A

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	■20	300	16K476	AFH3-28-30	B0300	FP227	TMD-2295	TVL-3639.8	
B	■20	300			BRI045	TC62	TD-10-450		
C	■10	300							
C2	30	6	16K477	PTT-6030	NLW30-6	TT6X30	MLV30-6	TE-1092	
C3	25	25	16K478	PTT-25025	NLW25-25	TT25X25	MLV25-25	TE-1207	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REMARKS	REPLACEMENT DATA				
	AEROVOX PART No.	CENTRALAB PART No.		CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	.5 6V			P282Z-5	WMF1P47E	IDP-4-504	GEM-205	2PS-P50
C5	.01 400V			P488N-01	D6-103	CUB4S1	4DP-1-103	4TM-S10
C6	.01 400V			P488N-01	D6-103	CUB4S1	4DP-1-103	4TM-S10
C7	.01 400V			P488N-01	D6-103	CUB4S1	4DP-1-103	4TM-S10
C8	300 .5%				TCZ-300	IR5D3	CM-19B-30J	10TCC-T30
C9	.01 400V			P488N-01	D6-103	CUB4S1	4DP-1-103	4TM-S10
C10	.001 400V			P488N-001	D6-102	CUB6D1	6DP-1-102	6TM-D10
C11	.005 400V			P488N-005	D6-502	CUB6D5	6DP-1-502	6TM-D5
C12	200 10%			NPO-SI 200	TCZ-200	5R5T2	CM-19B-20K	10TCC-T20
C13	.005 400V			P488N-005	D6-502	CUB6D5	6DP-1-502	6TM-D50
C14	.002 400V			P488N-002	D6-202	CUB6D2	6DP-1-202	6TM-D20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
RIA	500K Shaft	$\frac{1}{2}$	9K671	B-60-S	A47-500K-Z	Q13-133	U48	Volume
B	Not Req.				KSS-3	Not Req.	Not Req.	Power Off-On Level
C	500K				SWE-12	76-1	US-26	
R2	500K	$\frac{1}{2}$	9K672					

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	REPLACEMENT DATA		REMARKS	ITEM No.	REPLACEMENT DATA		REMARKS
	IRC PART No.	WORKMAN TV PART No.			IRC PART No.	WORKMAN TV PART No.	
R3	50K			R16	100K		
R4	1meg			R17	200K		
R5	2meg			R18	1meg		
R6	250K			R19	50K		
R7	3000 Ω			R20	30K 1W		
R8	250K			R21	3000 Ω		
R9	500K			R22	250K		
R10	120K			R23	1000 Ω		
R11	50K			R24	30K		
R12	2500 Ω			R25	10 Ω		
R13	100K			R26	2000 Ω 1W		
R14	1meg			R27	30K		
R15	150K						

COILS (RF-IF)

ITEM No.	REPLACEMENT DATA		NOTES
	COLUMBIA PART No.	Merit PART No.	
L1	20K434		

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	SEC. 2	COLUMBIA PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	
T1	117V @ .15A	230V @ .05A	6.3V @ 1A	3K272				

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
	PRI.	SEC.	COLUMBIA PART No.	Merit PART No.	Stancor PART No.	Triad PART No.	
T2	12.5K	3-4 Ω	3K273	A-2933①	A-3879①	24S98①	S-10X

① Drill new mounting hole.

SPEAKER

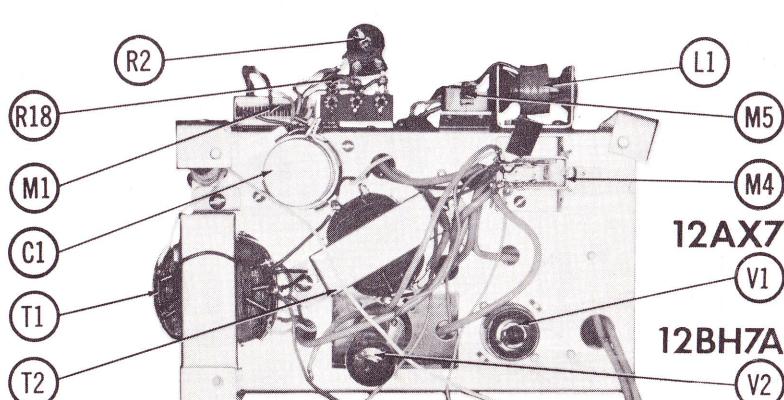
ITEM No.	TYPE		REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	COLUMBIA PART No.	
SP1	4" x 6"	PM	3-4 Ω	IK181	46A1

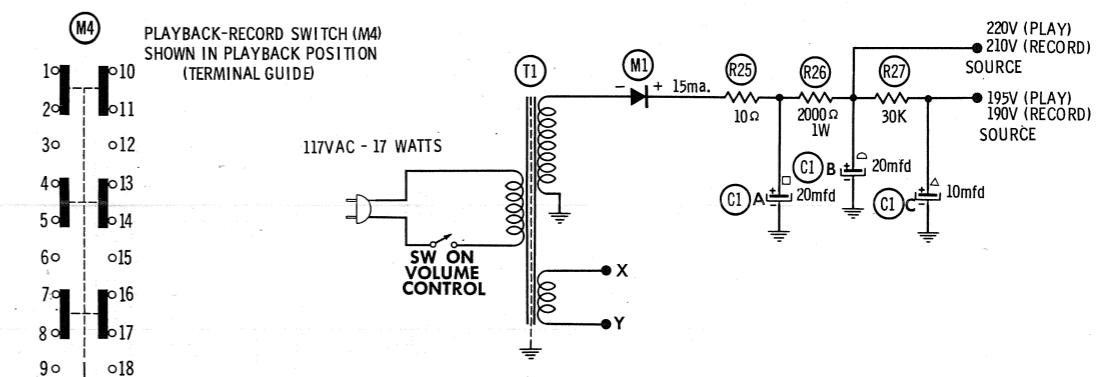
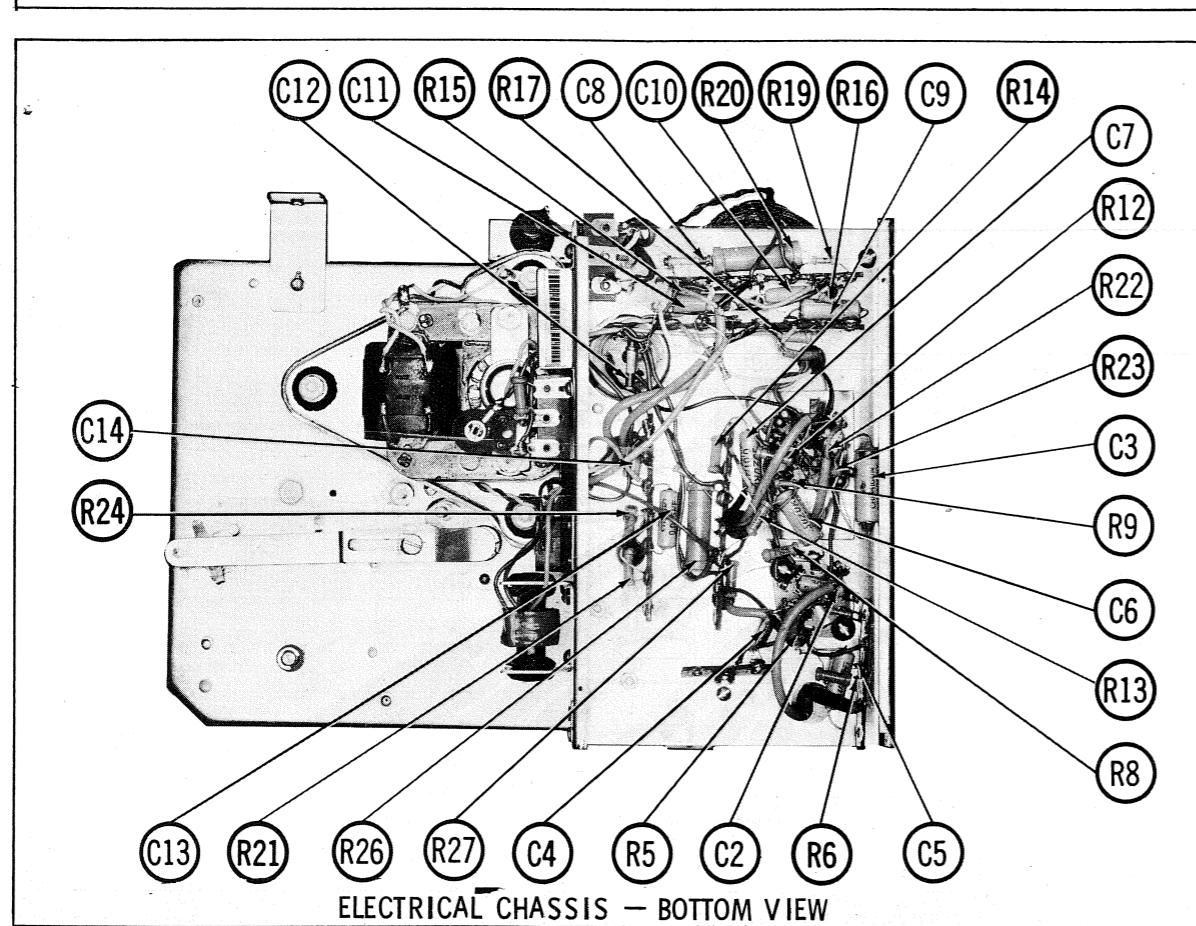
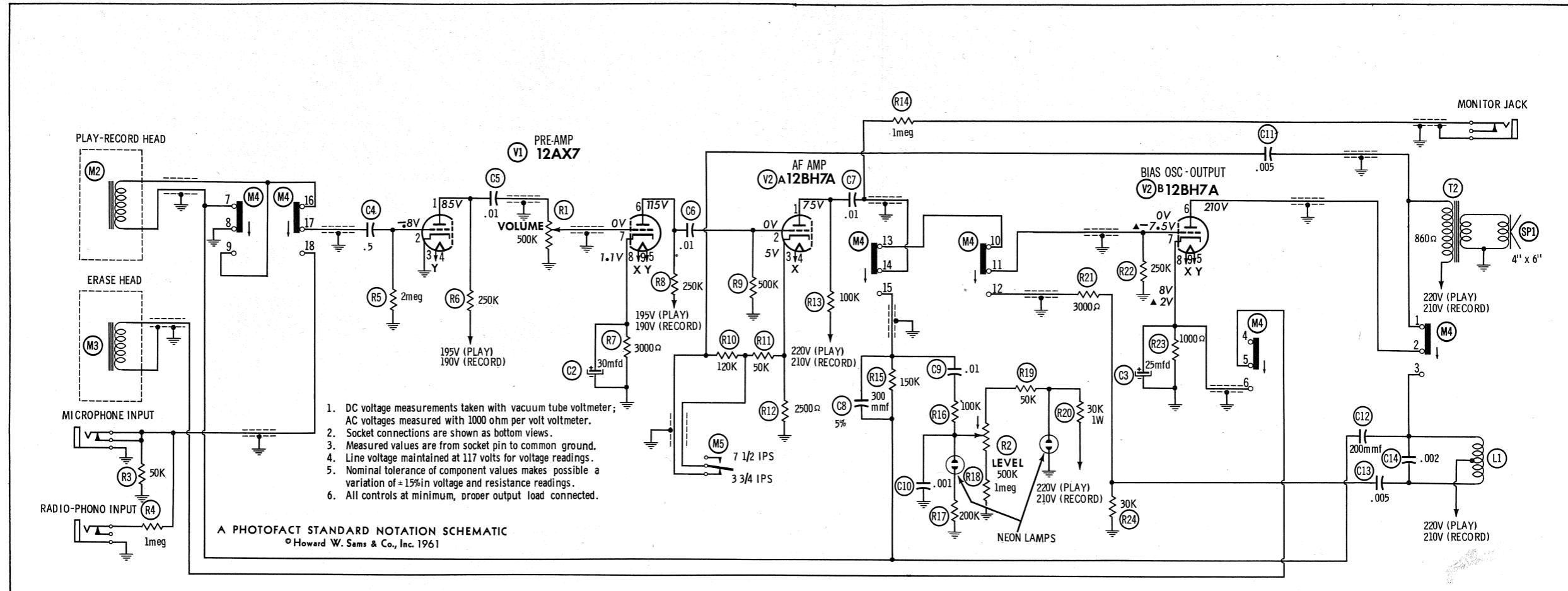
POWER RECTIFIERS

ITEM No.	RATING		REPLACEMENT DATA				NOTES
	CURRENT (Measured)	COLUMBIA PART No.	RCA PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.		
M1	.015A	10K624 *					* Selenium

MISCELLANEOUS

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors
Power Cord	Use BELDEN No. 8524 (Stranded) Available in Ten Colors
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 1765-B (6 Ft. Length)
	1725-K ($\frac{1}{2}$ Ft. Length)
Phono Pick-up Arm Cable	Use BELDEN No. 8401
	Use BELDEN No. 8430 (Two Conductor - Twisted)





RESISTANCE READINGS										
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	† 280K	2meg	0Ω	1Ω	1Ω	† 280K	0Ω	3000Ω	NC
V2	12BH7A	† 100K	500K	2500Ω	1Ω	1Ω	† 3000Ω	250K	1000Ω	NC

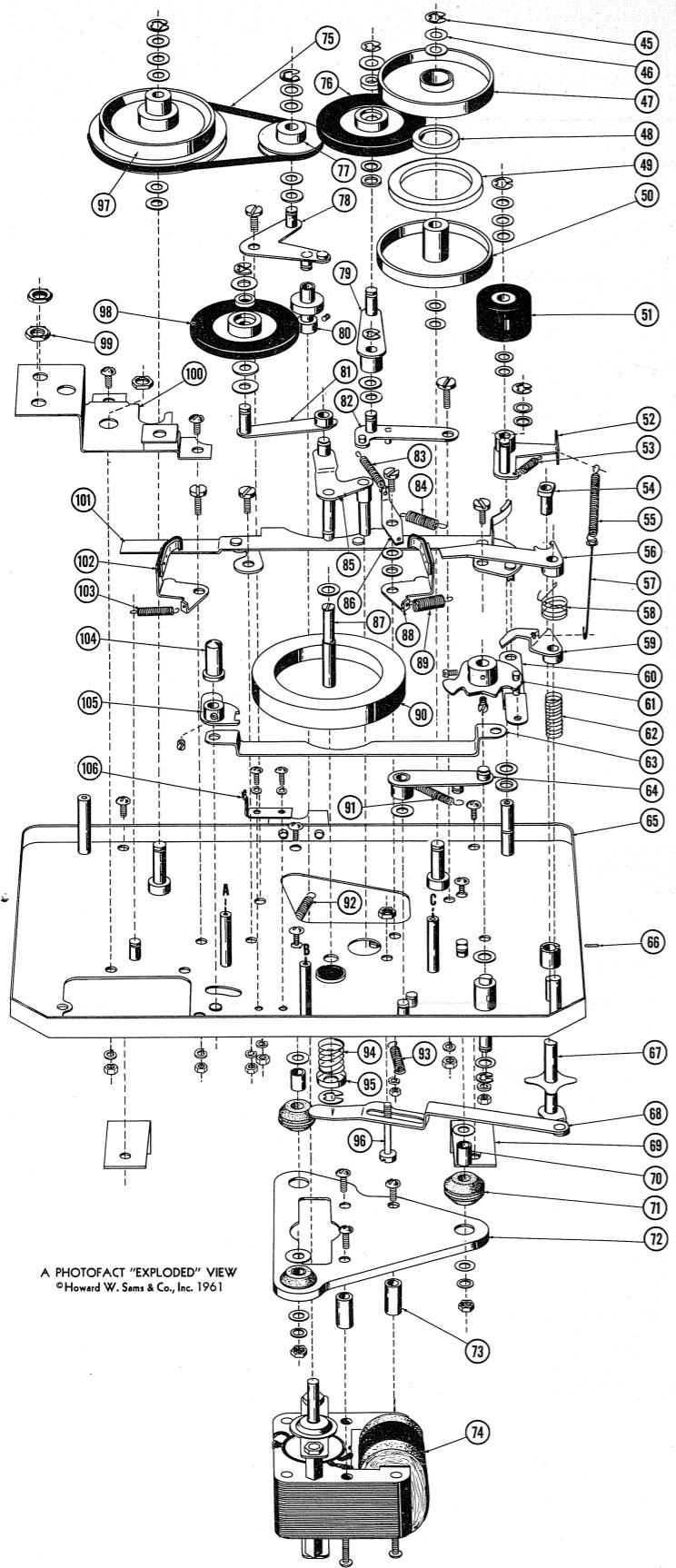
ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.

▲ MEASURED IN "RECORD" POSITION.

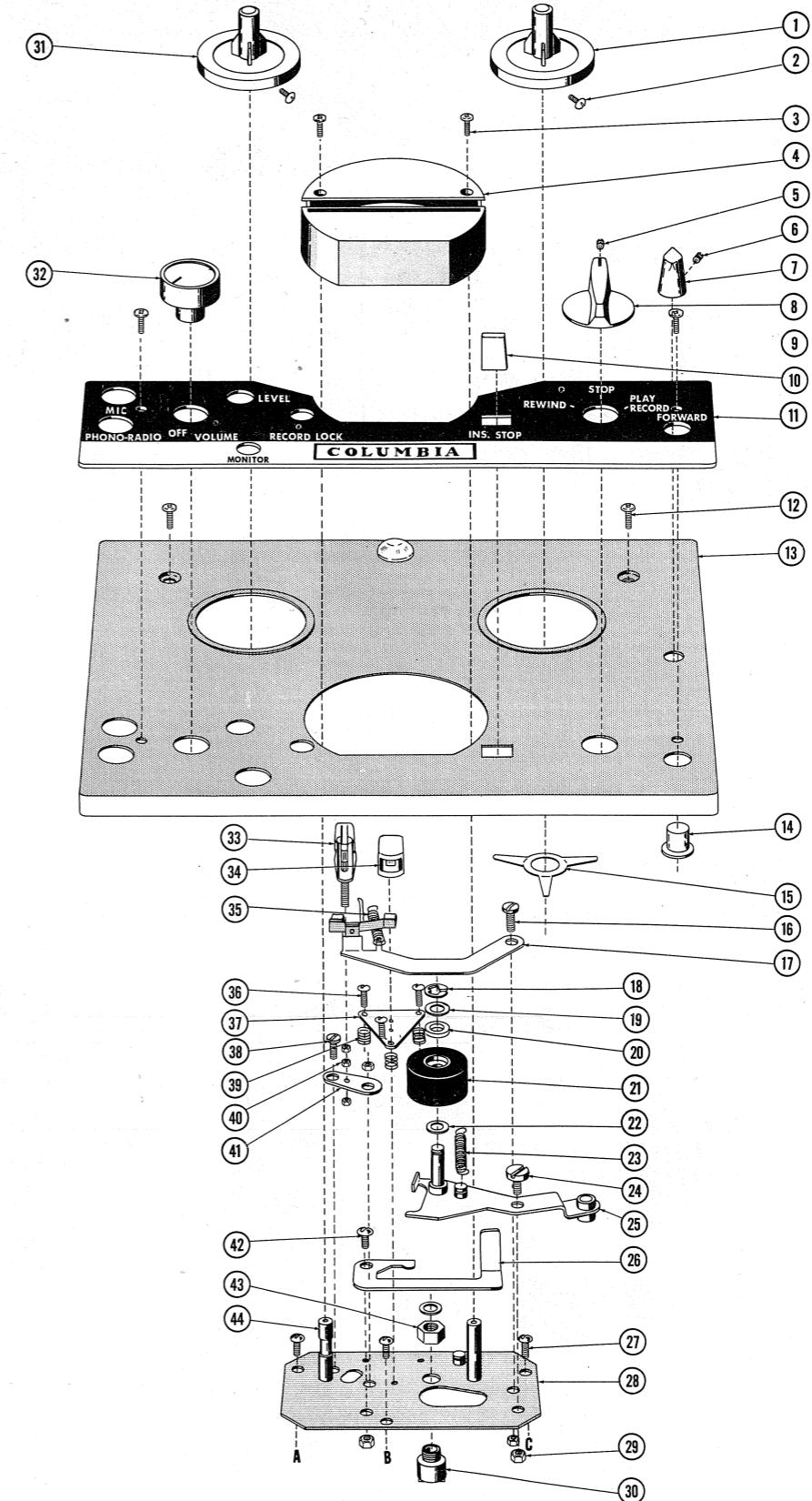
† MEASURED FROM OUTPUT OF M1.

NC NO CONNECTION

COLUMBIA
 MODEL C690-TR



EXPLODED VIEW OF PARTS BELOW BASE PLATE



EXPLODED VIEW OF PARTS ABOVE BASE PLATE